PART ELEVEN

# ART WORK

... OF ...

# ST. CLAIR COUNTY

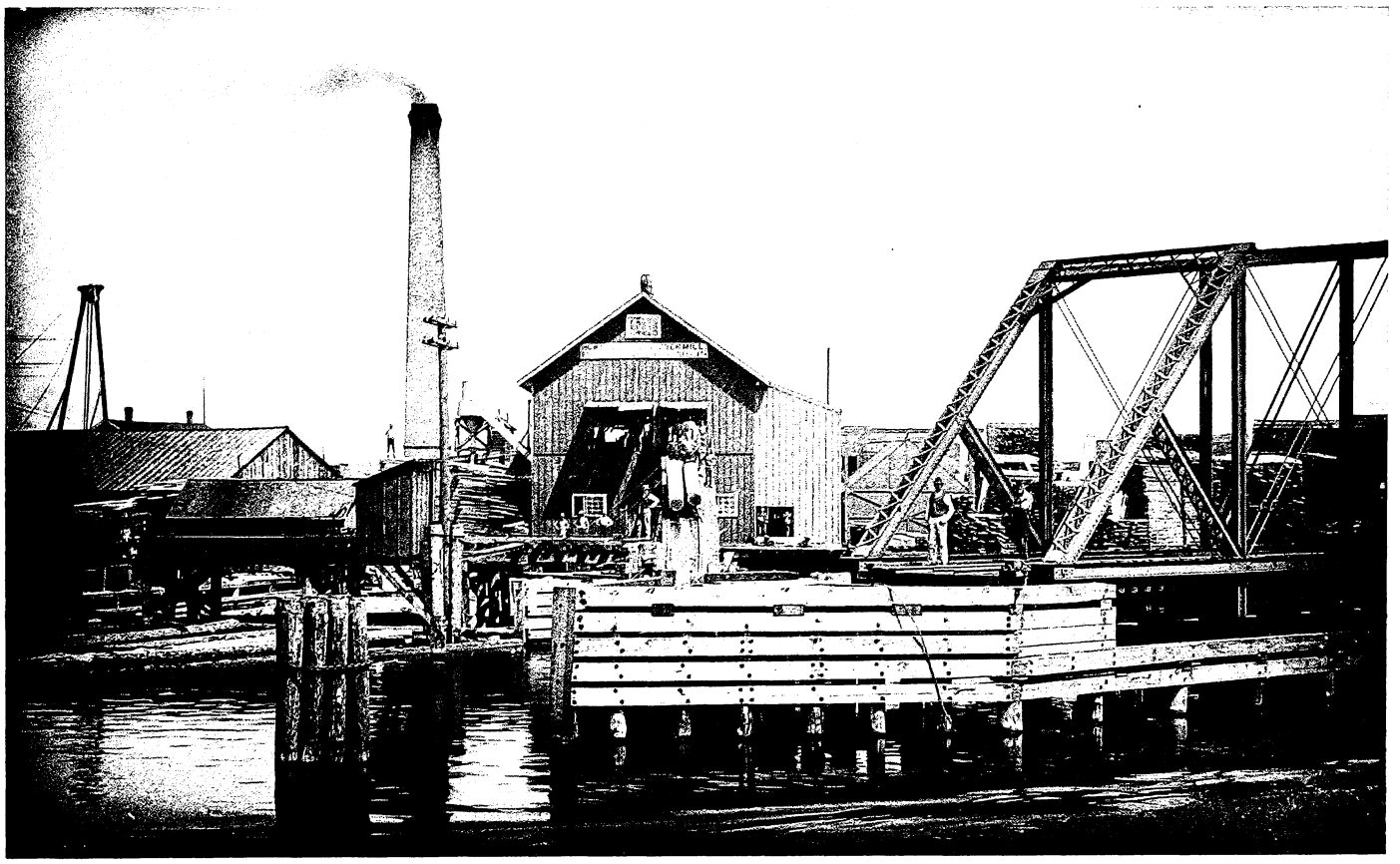
Published in Twelve Parts.

THE W. H. PARISH PUBLISHING CO.
1893.

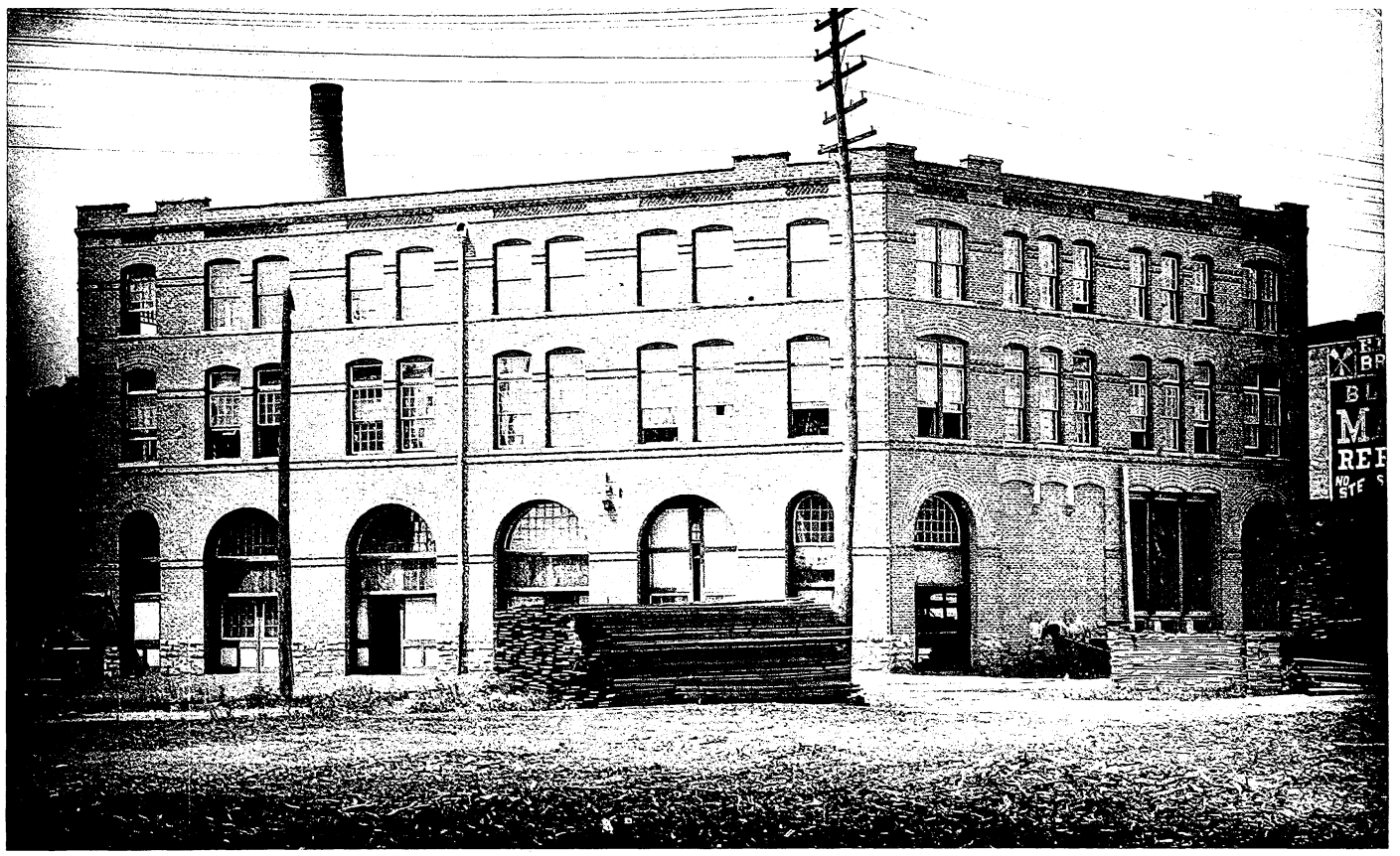

SCENE ON HURON AVENUE—Port Huron.

MICHAEL'S HALL—YALE.

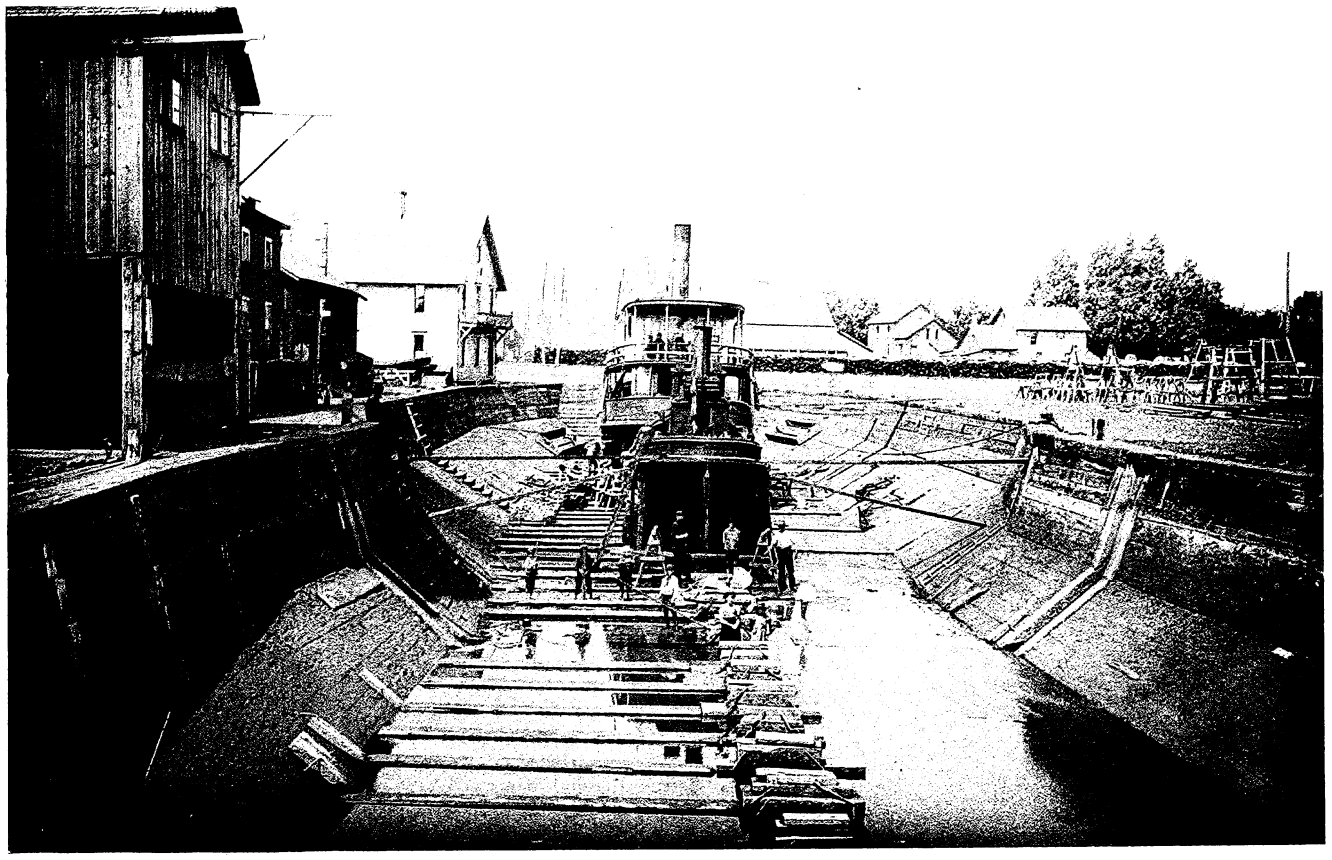

MARTIN BLOCK—YALE.



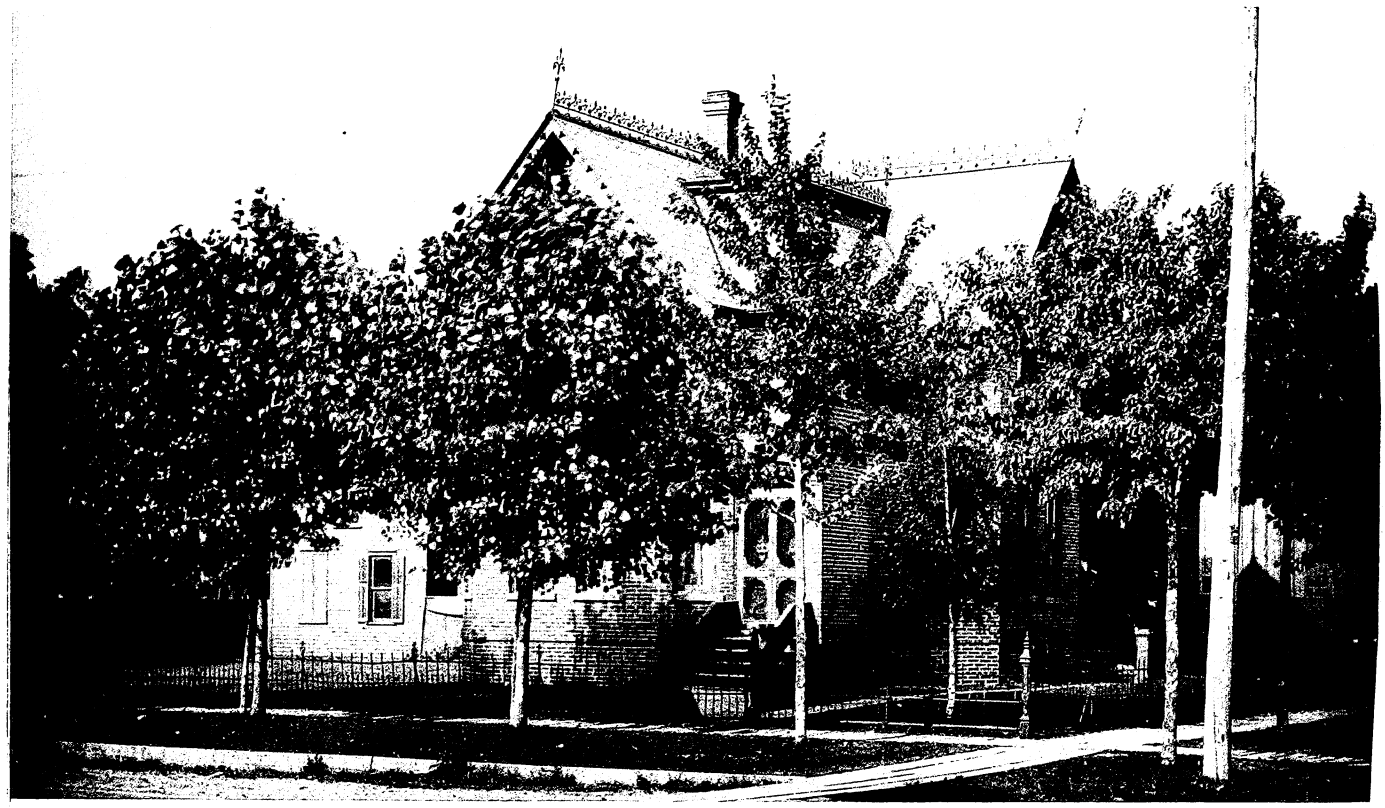
LUMBERING MILLS OF H. HOWARD—Port Huron.



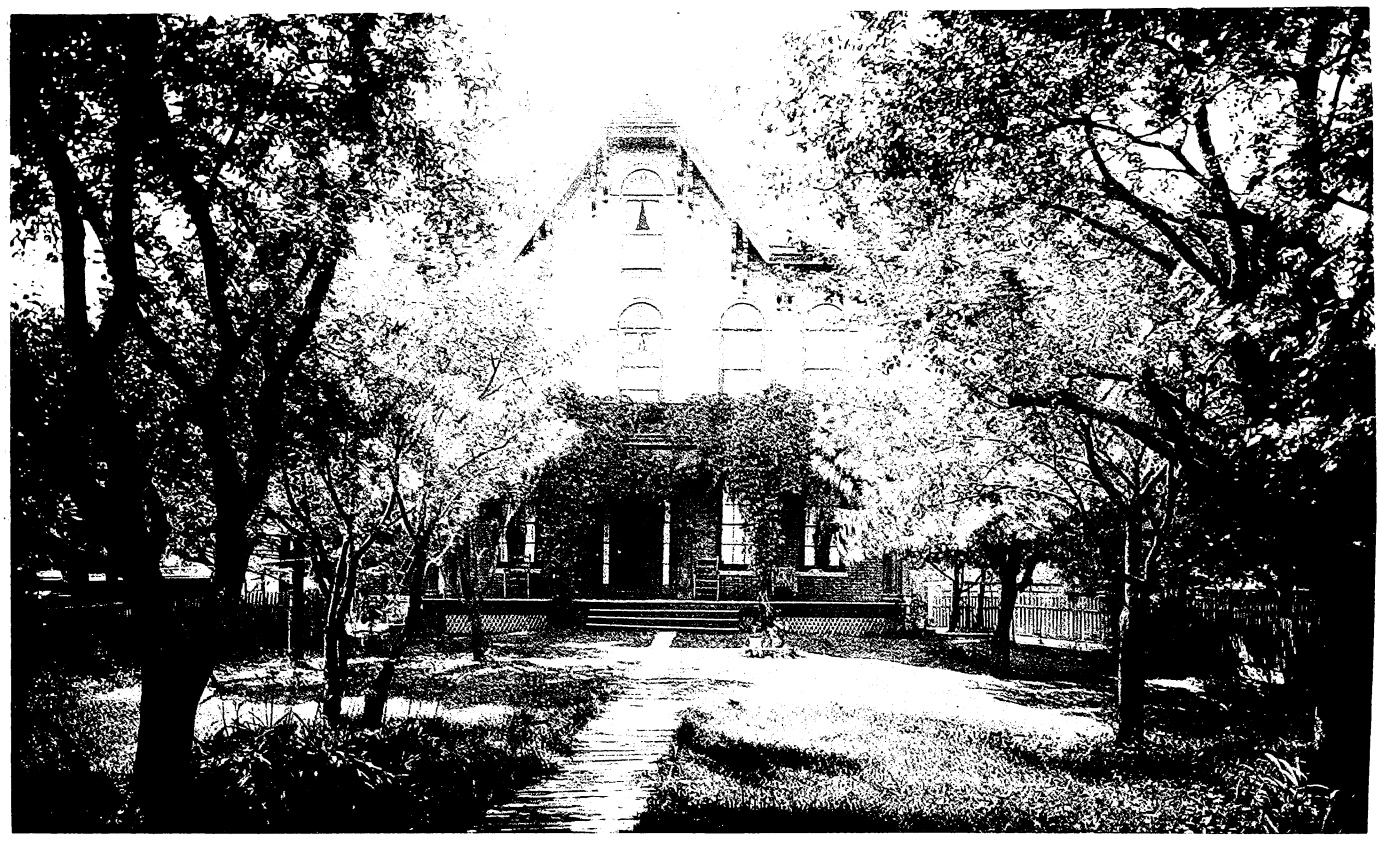
SASH, DOOR AND BLIND FACTORY OF R. M. CAMPBELL—Port Huron.



DUNFORD & ALVERSON DRY DOCKS—Port Huron.



RESIDENCE OF R. G. BURWALL—Port Huron.



RESIDENCE OF N. MILLS—Marysville.

"NATURAL GAS.

"Little, if any, inconvenience was experienced from natural gas. An immense quantity of fresh air was pumped into the tunnel, and every known means was taken advantage of to the end that pure air should pervade the tunnel and thus render safe the lives of the men engaged. Davy safety lamps were intrusted to cautious, experienced men and everywhere kept burning. This absence of gas was very gratifying to the management of the tunnel, as in the outset the possibility of encountering gas in great quantities gave the engineer much concern.

"THE LINING OF THE TUNNEL.

"The lining or curbing of the tunnel consists of cast-iron segments bolted together. In each ring of lining there are thirteen segments, or plates, and a smaller key piece. Each plate is four feet eleven and three-fourths inches long by eighteen inches wide and two inches thick. Each plate, or segment, has flanged ends and sides, through which the bolts are introduced, and by this means the various segments are firmly fastened together, forming a complete circle. A shimming of wood, like a piece of veneering, is cut to fit the ends and sides of the segments, with holes cut to receive the bolts. These pieces of wood are placed on the ends, or rather between the ends, and sides of the plates, and they are firmly held in place by the screw bolts which hold the plates together. The object of the shimming is to make water-tight joints, and thus keep the water from the tunnel. This plan is reasonably successful, yet not entirely so, for between the joints here and there the water oozes through, not from above as one might be led to suppose, but from the bottom. This water, as the resident engineer informs me, does not come from the river, but from the rock. By reference to the inclosed sketch it will be observed that the summit of the rock is but six to eight feet below the bottom of the tunnel, under a considerable portion of the river's bed. To render the tunnel still more secure from a flow of water, the joints in the segments, or rather the joints formed by the joining of the segments, in the lower half of the great tube are calked with lead mush, as the seams of a wooden ship are calked with oakum. After the seams are thoroughly calked a thick coating of cement is plastered over the curbing, after which a brick lining is placed upon this. This brick lining serves the purpose of protecting the iron lining from the action of salt brine which escapes from passing refrigerator cars. Before being placed in position the iron plates of the tunnel are treated to a thick coating of hot coal-tar, and a grouting of Portland cement mixed with sand and gravel is

made to form the tunnel bed. The weight of the iron consumed in lining this tunnel, and which is now in position, is 27,000 tons. The shield being of greater diameter than the curbing a space of a few inches remains to be filled. This space is filled on the bottom and half way up each side by a process which forces liquid to the place desired.

"Directly under the angle of the bank on the Canadian side of the river is the lowest dip or depression of the tunnel, as will be seen by reference to the sketch before mentioned. At this point will be located the pump, which is designed to relieve the tunnel from surplus water which may from any cause find its way to the tube.

## "DEPTH OF WATER AND CLAY.

"The maximum depth of water over the tunnel is 40.47 feet, and the minimum depth of clay over the tunnel under the bed of the river is 8.43 feet. The rock summit, as shown in the diagram, lies less than seven feet, in some places, from the great iron tube. Thus, it will be observed, the depth of clay from the bottom of the river to the top of the rock was just sufficient to leave a margin of from seven to ten feet betwixt the top of the tunnel and the water, and about the same distance intervenes, on an average, betwixt the bottom of the tunnel and the summit of the rock. Taking into consideration the quality of the clay and its comparative freedom from dangerous deposits of gas, its depth under the river and above the rock, its softness and other valuable characteristics, it is doubtful if a more favorable location for the construction of a tunnel could be found. Indeed, if the distinguished engineer who was intrusted with this work could have had a choice as to the composition, consistency and quality of the clay through which the great shield was to be forced, he could not have selected any quality of soil better adapted for the purpose. For most of the distance under the river the clay was as soft as putty prepared for use in glazing.

## "SOUNDS HEARD IN THE TUNNEL.

"I am informed by workmen who are engaged in the tunnel that they frequently distinguish the sound of the revolving wheels of steamers, which almost hourly during the season of navigation pass over their heads, and that during the excursion season they frequently hear the beating of the drum and other sounds of music discoursed by bands on board these steamers.